

U.S. Patent Application No. 09/833,202
Request for Reconsideration dated June 13, 2006
Response to Office Action of March 13, 2006

REMARKS

Reconsideration and continued examination of the above-identified application are respectfully requested.

Election/Restrictions

At page 2 of the Office Action, the Examiner maintained the Restriction Requirement made in the previous Office Action. The applicants have not canceled these claims in order to reserve the right to seek review of the Restriction Requirement.

Objection to the Amendment Filed February 16, 2006

At page 2 of the Office Action, the Examiner objected to the amendment filed on February 16, 2006, under 35 U.S.C. §132(a) for introducing new matter into the disclosure. Particularly, the Examiner alleged that the amendment to claim 17 which recites "the fuel cell comprises an active layer comprising a carbon support that comprises at least one modified carbon product" is not supported by the original disclosure because the entire application discloses that either "the electrode, the counter-electrode or the electrolyte membrane comprises at least one modified carbon product." For the following reasons, this objection is respectfully traversed.

The applicants respectfully disagree with the Examiner's position on this language. This language in claim 17 is clearly supported by the present application. For instance, at page 4, lines 17-19, the present application clearly states that the active layer can contain at least one modified carbon product and that the active layer is part of a gas diffusion electrode. It is

U.S. Patent Application No. 09/833,202
Request for Reconsideration dated June 13, 2006
Response to Office Action of March 13, 2006

respectfully noted that claim 17 specifically recites a gas diffusion electrode, and further recites that the fuel cell comprises an active layer. Clearly, the active layer would be part of the gas diffusion electrode. Moreover, at page 5, lines 4-7, the present application clearly recites, without reference to an electrode or even fuel cell, that the present invention relates to a modified carbon product in the active layer having a modified carbon product having attached at least one organic group and catalytic material. Elsewhere in the present application, there is further support. Thus, the language as set forth in claim 17 is clearly supported by the present application. If this is the only remaining issue with respect to the allowability of the present application, the applicants may be willing to recite that the gas diffusion electrode comprises the active layer as set forth in claim 17. Accordingly, for these reasons, this objection should be withdrawn.

Rejection of Claims 1, 3-8, 10, and 17-28 Under 35 U.S.C. §112, First Paragraph - Written Description

At page 4 of the Office Action, the Examiner rejected claims 1, 3-8, 10, and 17-28 under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. Particularly, the Examiner repeated the position taken with respect to the objection to the Amendment filed on February 16, 2006, as indicated above. For the following reasons, this rejection is respectfully traversed.

As stated above, the present application clearly provides a written description for the invention recited in claim 17. Therefore, this rejection is improper and should be withdrawn.

U.S. Patent Application No. 09/833,202
Request for Reconsideration dated June 13, 2006
Response to Office Action of March 13, 2006

Rejection of Claims 1, 3-8, 10, and 17-28 Under 35 U.S.C. §112, First Paragraph - Non-Enablement

At page 5 of the Office Action, the Examiner rejected claims 1, 3-8, 10, and 17-28 under 35 U.S.C. §112, first paragraph as based on a disclosure that is not enabling. Particularly, the Examiner alleged that the specific subject matter “wherein the electrode or counter electrode or both comprise at least one modified carbon product” is critical or essential to the practice of the invention, but it is not included in the claims. Further, the Examiner alleged that since claim 17, by way of the February 16, 2006 Amendment recites that “the fuel cell comprises an active layer comprising a carbon support that comprises at least one modified carbon product,” such that it includes other fuel cell components other than the electrode, the counter electrode, or the electrolyte membrane, therefore the present application is not enabling with respect to this feature. For the following reasons, this rejection is respectfully traversed.

As indicated above, the present application clearly describes the embodiments set forth in claim 17, and clearly enables one to make a fuel cell having an active layer that comprises a carbon support using the modified carbon product recited in claim 17. Throughout the present application, there is clear guidance to one skilled in the art how to do so. Accordingly, this rejection should be withdrawn as well.

Rejection of Claim 17 Under the Judicially Created Doctrine of Obviousness-type Double Patenting over Claims 1 - 3 of U.S. Patent No. 6,881,511

At page 6 of the Office Action, the Examiner rejected claim 17 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-3 of

U.S. Patent Application No. 09/833,202
Request for Reconsideration dated June 13, 2006
Response to Office Action of March 13, 2006

U.S. Patent No. 6,881,511. The Examiner alleged that the claims of the '511 patent encompass the use of a modified carbon product in a solid polymer fuel cell and/or metal-air battery, which the Examiner alleged is a type of fuel cell. For the following reasons, this rejection is respectfully traversed.

Upon further review of this rejection, the applicants note that U.S. Patent No. 6,881,511 B1 is assigned to Cabot Corporation and Edison Thermoelettrica, SpA, whereas the present application is assigned only to Cabot Corporation. Therefore, the present application and the '511 patent are not commonly assigned/owned. Further, there is no common inventor between the present application and the '511 patent. In addition, the Examiner's attention is directed to the MPEP which provides a flow chart showing that when the application and patent are not commonly owned and do not have a common inventor, no double-patenting rejection should be made. For these reasons, this rejection should be withdrawn.

Rejection of claims 1, 3-8, 10, and 17-28 Under 35 U.S.C. §102(e) Over Yu et al.

At page 8 of the Office Action, the Examiner rejected claims 1, 3-8, 10, and 17-28 under 35 U.S.C. §102(e) over Yu et al. (U.S. Patent No. 6,399,202). The Examiner essentially repeated the position taken in the previous Office Action, and provided additional comments as indicated herein. Moreover, the Examiner alleged that Yu et al. describes with sufficient specificity that a carbon-modified product is present in a layered form and that there is a preference of proton conducting properties. The Examiner alleged that a layer comprising any combination of modified materials would produce a layer exhibiting the specific proton conducting property, and that products of identical chemical composition cannot have mutually exclusive properties, and

U.S. Patent Application No. 09/833,202
Request for Reconsideration dated June 13, 2006
Response to Office Action of March 13, 2006

thus, the proton conducting property is necessarily present in the prior art material. Finally, the Examiner alleged that the limitation "a thickness of about 5 microns or less" means that no active layer is required. Applicants note that the position taken by the Examiner here is repeated on the latter art rejections. Therefore, in order to reduce repetitious comments and/or arguments, the Examiner's comments above and the applicant's arguments below will be referred to below. For the following reasons, this rejection is respectfully traversed.

Applicants continue to disagree with the Examiner's position and the arguments provided in the previous Response apply equally here. Applicants herein provide additional arguments in response to the Examiner's additional comments.

As stated in the previous response, claim 1 and all other claims are directly or indirectly dependent on claim 17. Claim 17 recites a fuel cell wherein an active layer is present and contains a modified carbon product having attached at least one organic group that is proton-conducting. These features are not taught or suggested in Yu et al. As indicated, examples 14 and 15 of Yu et al. do show mixing specific catalyst particles, namely cobalt porphyrin with a modified carbon product, however, it is important for the Examiner to realize that in examples 14 and 15 of Yu et al., and more particularly, example 15, the carbon-supported catalyst was heated to high temperature, such as 900° C, for one hour in order to be activated and to cause "pyrolysis." In other words, at this high temperature, the organic groups present on the carbon product would have been destroyed by the high temperature. In Yu et al., it must be realized that Yu et al. considered the use of modified carbon products to be useful for purposes of obtaining a uniform dispersion of the modified carbon product in various components of the fuel cell, but did not recognize the benefit of maintaining proton-conducting groups on the carbon support of the

U.S. Patent Application No. 09/833,202
Request for Reconsideration dated June 13, 2006
Response to Office Action of March 13, 2006

active layer once the active layer was formed and to be used in a fuel cell. Thus, Yu et al, appreciated the benefit of obtaining uniform dispersions through the use of organic groups attached onto carbon products, but did not appreciate the advantage of maintaining certain types of organic groups on active layers, once the active layer is formed and ready to use. In fact, in example 15, second paragraph, Yu et al. even acknowledges that pyrolysis occurred, which clearly would have destroyed the organic groups on the carbon products. Thus, a purpose and an advantage of the present invention, namely maintaining proton conducting groups on the modified carbon product in an active layer, is not taught or suggested in Yu et al. The advantages of maintaining these proton conducting groups on the carbon product as part of the active layer is discussed in considerable detail in the present application, including the examples, for instance, beginning at page 22. Also, Yu et al., at col. 2, lines 60-64, actually discusses properties of the monomer, and not of the modified carbon product, contrary to the Examiner's assertions at page 9 of the Office Action. Further, the remaining portions of Yu et al. identified by the Examiner do not discuss the presence of proton conducting groups on the carbon product, once the active layer is formed. As stated, the examples in Yu et al. actually pyrolyze the carbon, thus destroying the groups. For these reasons, Yu et al. does not teach or suggest the claimed invention and the rejection should be withdrawn. The Examiner is encouraged to contact the undersigned by telephone to further discuss this matter, should there be any remaining questions on the differences between Yu et al. and the present invention. Furthermore, the applicants are more than willing to prepare a Declaration by the inventor to further confirm these arguments set forth above. Accordingly, for at least these reasons, the rejection should be withdrawn.

Also, as stated in the previous response, the applicants disagree with the Examiner's

U.S. Patent Application No. 09/833,202
Request for Reconsideration dated June 13, 2006
Response to Office Action of March 13, 2006

position that an active layer is not claimed in claim 1. Claim 17 clearly recites an active layer. Although claim 1 recites "said active layer has a thickness of 10 microns or less," this claim depends on claim 17, and therefore it cannot be interpreted that an active layer is not claimed simply based on the "or less" language. In order to avoid needless amendments at this time, applicants submit that once the Examiner withdraws the art rejection as argued herein, claim 1 can be amended to recite "greater than 0" with respect to the lower thickness range of the active layer as specifically requested by the Examiner.

Accordingly, this rejection should be withdrawn.

Rejection of Claims 1, 17, and 26-28 under 35 U.S.C. §102(e) over Tosco et al.

At page 13 of the Office Action, the Examiner rejected claims 1, 17, and 26-28 under 35 U.S.C. §102(e) over Tosco et al. (U.S. Patent No. 6,881,511). The Examiner essentially repeated the position taken in the previous Office Action and provided additional comments as noted above, with respect to the rejection over Yu et al. Therefore, applicants' arguments with respect to the Yu et al. reference apply equally here. For the following reasons, this rejection is respectfully traversed.

As indicated previously and above with respect to Yu et al., Tosco et al. has essentially the same disclosure as Yu et al., and has been distinguished above. For these same reasons, Tosco et al. does not teach or suggest the claimed invention. Tosco et al. has the same examples, namely examples 14 and 15, and as described above, the active layer formed in examples 14 and 15 would not contain proton-conducting because the modified carbon product is subjected to high temperature and pyrolyzed to form an active layer. For these reasons, this rejection should

U.S. Patent Application No. 09/833,202
Request for Reconsideration dated June 13, 2006
Response to Office Action of March 13, 2006

be withdrawn as well.

Rejection of Claims 1 and 17 Under 35 U.S.C. §102(b) over Swathirajan et al.

At page 15 of the Office Action, the Examiner rejected claims 1 and 17 under 35 U.S.C. §102(b) over Swathirajan et al. (U.S. Patent No. 5,316,871). The Examiner essentially repeated the position taken in the previous Office Action, and provided additional comments as indicated herein. Particularly, at page 19 of the Office Action, the Examiner alleged that Swathirajan et al. discloses that it is known to attach or bond the organic groups to the active layer (Col. 12, lines 60-65), and therefore Swathirajan et al. readily envisions attaching or bonding an organic group such as a carboxylic group to the surface of the carbon material. For the following reasons, this rejection is respectfully traversed.

Claim 17 requires a solid electrolyte membrane and an active layer having a modified carbon product having an organic group that is proton-conducting. Swathirajan et al. does not teach or suggest at least one organic group that is proton-conducting that is attached to the active layer. As indicated in the previous response, Swathirajan et al. only mentions carbon particles that have carboxylic groups, at col. 12, lines 60-65. As indicated before, carboxylic groups are not proton-conducting groups. The applicants are more than willing to provide a Declaration from the inventor, who has expertise in this subject matter, to confirm this point should the Examiner wish to have this additional evidence. Further, if helpful, the inventor is more than willing to have a telephone interview with the Examiner and the undersigned to further explain these differences. The Examiner has not provided any showing that Swathirajan et al. teaches or suggests at least one organic group that is proton-conducting attached to an active layer.

U.S. Patent Application No. 09/833,202
Request for Reconsideration dated June 13, 2006
Response to Office Action of March 13, 2006

Therefore, this rejection should be withdrawn.

CONCLUSION

In view of the foregoing remarks, the applicant respectfully requests the reconsideration of this application and the timely allowance of the pending claims.

If there are any fees due in connection with the filing of this response, please charge the fees to Deposit Account No. 03-0060. If a fee is required for an extension of time under 37 C.F.R. § 1.136 not accounted for above, such extension is requested and should also be charged to said Deposit Account.

Respectfully submitted,



Luke A. Kilyk
Reg. No. 33,251

Atty. Docket No. 01023 (3600-344-01)
KILYK & BOWERSOX, P.L.L.C.
400 Holiday Court, Suite 102
Warrenton, VA 20186
Tel.: (540) 428-1701
Fax: (540) 428-1720